Key Stage 4 Curriculum Journey: Computer Science
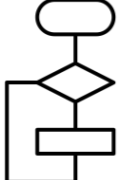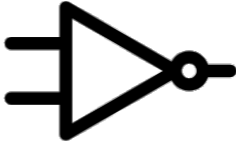
The curriculum in Computer Science will give pupils the opportunity to understand and apply the fundamental principles and concepts of Computer Science through practical experience of analysing problems in computational terms as well as understand the components that make up digital systems and the impacts of digital technology to the individual and to wider society.

	YEAR 10 CURRICULUM JOURNEY					
	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Topic	Systems Architecture and Memory	Units and data storage	Computer Networks	Computer Networks	System Software/Ethical, Legal, Cultural and Environmental Impact of Tech	Programming Fundamentals
Key Knowledge, Skills & Understanding	• Purpose of CPU • Common CPU components and their purpose • Von Neumann architecture • Common characteristics that affect performance of CPU • Purpose and characteristics of embedded systems • Need for primary and secondary storage • Difference between RAM/ROM • Common types of storage Advantages and disadvantages of different storage devices relating to their characteristics	• Units of data storage • Calculation of data capacity requirements • Base 2/10/16 number conversions and addition • Binary addition and overflow errors • Binary shifts • The use of binary codes to represent characters • The use of binary codes to represent images, the factors that affect file size/quality of images • Sound can be sampled, and effect of sample rate, duration and bit depth on the playback quality and file size Need and use for lossy/lossless compression	• Difference between LAN and WAN • Factors that affect performance of a network • Different roles of devices in client server, and peer to peer models • Hardware needed to create a network • Star and mesh topologies How the internet works	• Wired VS wireless connections • Role of encryption • Use of IP and MAC addressing • Standards and common protocols in networking • Concept of layers in a network • Threats to computer systems and networks Identifying and preventing vulnerabilities	• Purpose and functionality of operating systems • Purpose and functionality of utility software • Impacts of digital technology on wider society Legislation relevant to computer science	• Use of variables, constants, operators, inputs, outputs and assignments • Three basic programming constructions (sequence/selection/iteration) • Common arithmetic operators • Common Boolean operators • Random number generation
GCSE Assessment Objectives	• **AO1** - Demonstrate knowledge and understanding of the key concepts and principles of Computer Science • **A02** - Apply knowledge and understanding of key concepts and principles of Computer Science	• **AO1** - Demonstrate knowledge and understanding of the key concepts and principles of Computer Science. • **A02** - Apply knowledge and understanding of key concepts and principles of Computer Science.	• **AO1** - Demonstrate knowledge and understanding of the key concepts and principles of Computer Science. • **A02** - Apply knowledge and understanding of key concepts and principles of Computer Science.	• **AO1** - Demonstrate knowledge and understanding of the key concepts and principles of Computer Science. • **A02** - Apply knowledge and understanding of key concepts and principles of Computer Science	• **AO1** - Demonstrate knowledge and understanding of the key concepts and principles of Computer Science. • **A02** - Apply knowledge and understanding of key concepts and principles of Computer Science.	• **AO1** - Demonstrate knowledge and understanding of the key concepts and principles of Computer Science • **A02** - Apply knowledge and understanding of key concepts and principles of Computer Science • **A03** - Analyse problems in computational terms
MAPs	2 x MAPs applying content to examination questions	3 x MAPs applying content to examination questions	3 x MAPs applying content to examination questions	3 x MAPs applying content to examination questions	3 x MAPs applying content to examination questions	3 x MAPs applying content to examination questions

WADE DEACON
HIGH SCHOOL

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YEAR 11 CURRICULUM JOURNEY						
	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Topic	Programming Fundamentals	Algorithms	Producing Robust Programs	Programming languages/Boolean Logic	COMP01 / COMP02 Examination Practice & Revision	
Key Knowledge, Skills & Understanding	• Basic string manipulation including substring and changing case/stripping string. • Basic file handling operators • Use of records to store data • Use of 1D and 2D arrays Use subprograms to produce structured code	• Principles of computational thinking • Identify inputs, processes and outputs for a problem • Structure diagrams • Create, interpret, correct, complete and refine algorithms • Identify common errors in algorithms • Complete trace tables Searching and sorting algorithms	• Defensive design considerations • Input validation • Maintainable programs • Purpose and types of testing programs • Types of errors • Selecting and using suitable test data • Refining algorithms	• Characteristics and purpose of different levels of programming languages • Purpose of translators (Inc. compilers and interpreters) • Common tools and features of an IDE • Simple logic diagrams using AND, OR and NOT. • Draw and complete truth tables Combine Boolean operators	• Revise knowledge, skills and understanding for COMP01 and COMP02 through recall and practice examination questions in preparation for June examination	
GCSE Assessment Objectives	• **AO1** - Demonstrate knowledge and understanding of the key concepts and principles of Computer Science • **A02** - Apply knowledge and understanding of key concepts and principles of Computer Science • **A03** - Analyse problems in computational terms	• **AO1** - Demonstrate knowledge and understanding of the key concepts and principles of Computer Science • **A02** - Apply knowledge and understanding of key concepts and principles of Computer Science • **A03** - Analyse problems in computational terms	• **AO1** - Demonstrate knowledge and understanding of the key concepts and principles of Computer Science • **A02** - Apply knowledge and understanding of key concepts and principles of Computer Science • **A03** - Analyse problems in computational terms	• **AO1** - Demonstrate knowledge and understanding of the key concepts and principles of Computer Science • **A02** - Apply knowledge and understanding of key concepts and principles of Computer Science	• **AO1** - Demonstrate knowledge and understanding of the key concepts and principles of Computer Science. • **A02** - Apply knowledge and understanding of key concepts and principles of Computer Science. • **A03** - Analyse problems in computational terms	
MAPs	• 3 x MAPs applying content to examination questions	• 3 x MAPs applying content to examination questions	• 2 x MAPs applying content to examination questions	• 2 x MAPs applying content to examination questions		